

Fall 1995  
Volume 20 Number 3  
July-August 1995

# Alaskan Transportation

## IN THIS ISSUE...

Exit Glacier Road project completed

SHRP work zone safety trailer completes tour of Alaska & Whitehorse

Shakwak project offers road construction tips for permafrost areas

Alaska Transportation Week to be held in Anchorage

## INSERTS...

Metriation...Test your metric know-how!

Computer Notes...What can a modem do for you?

Field Notes...Valdez District finds a way to repair guardrail ends

## PLUS...

New Publications in the T<sup>2</sup> Library

T<sup>2</sup>'s calendar of exciting upcoming events

Who's Who in Alaskan Transportation

*This newsletter is funded by a grant from the Federal Highway Administration and the Alaska Department of Transportation and Public Facilities.*

## Local Technical Assistance Program

### Shakwak project tackles construction challenges in permafrost-ridden terrain

The Shakwak Project involves reconstruction of the Haines Road and part of the Alaska Highway over a total length of 520 km. With the 185-km

Haines Road already completed, the current construction work is focused on the most northerly part of the



*Photo courtesy of the Yukon Government*

*Liquefying permafrost can cause some construction difficulties.*

Alaska Highway in the Yukon Territory (62° to 63° North latitude).

*See Shakwak on page 3*

### SHRP trailer wraps up statewide tour

The Strategic Highway Research Program (SHRP) work zone safety products trailer has come and gone, its whirlwind tour of Alaska and Whitehorse finished. At least it felt like a whirlwind to those of us responsible for getting it around.

We figure our borrowed blue state suburban towed that trailer 2,305 miles, then traveled empty from Skagway back to Fairbanks, a distance of 710 miles.

Alaska T<sup>2</sup> owes thanks and appre-

ciation to a number of people for coordinating our visits to a number of communities and construction projects, and if we miss anyone's

name we apologize: Dennis Morford, DOT&PF, Central Region Traffic; David Mumford, Municipality of Anchorage Traffic Engineer; Fred Korpinen, Kenai Peninsula Bor-



*Gail Gardner, Janet Brown and Pat Miller get a closer look at the equipment at the SHRP demonstration while Jim Bennett converses with Jim Merrill.*

ough Roads Director; George Church, Soldotna DOT&PF Main-

*See Trailer on page 4*

# Exit Glacier Road project an apparent success

The 7.3-mile Exit Glacier Road near Seward, Alaska was recently reconstructed by the Western Federal Lands Highway Division (WFLHD) of the Federal Highway Administration as a part of the Federal Lands "Forest Highway" program. This road, which is owned by the Alaska Department of Transportation, is the principle access route to the Kenai Fjords National Park.

The design and construction of the Exit Glacier Road reflects unprecedented collaborative efforts by the City of Seward, Kenai Peninsula Borough, Alaska Department of

Transportation & Public Facilities, National Park Service, U.S. Forest Service and the FHWA, in particular many people from the WFLHD, together with exceptional local citizen leadership and support.

Reconstructing this mostly single lane, narrow, graded road into a double lane, safe, dependable scenic access to a wilderness national park was, at first, a daunting environmental challenge.

The constructed road improvements included 1 1/2 miles of relocated road on a new alignment that crossed numerous rivers, 2,200 feet

of prime wetlands and larger riparian zones, all of which are important anadromous fish spawning and rearing habitats. Impacts on these fishery resources were of great concern to all parties. Extensive and unique mitigation for water quality, wetlands, riparian zones and fishery resource impacts were developed and implemented through multi-federal, state and local agency efforts.

The mitigation plan for the construction project which had the most impacts to the natural resources included these features:

- Special placement and sizing of numerous large and small pipe culverts, a large concrete box culvert and clear span bridges to provide effective fish passage opportunities through the highway embankment as it crossed the maze of waterways on the floodplain.

- Large root wads and heavy rock riprap were uniquely installed to stabilize the river bank and yet provide natural fish resting sites in the heavy current.

- Eight, small, interconnected ponds used as salmon spawning beds were enhanced and created in off-site, but nearby, stream diversions.

- Two ponds were created to provide natural salmon rearing habitat with meandering channels, islands, native vegetative cover and variable water depths to hold the juvenile salmon before their run to the sea.

The initial formal post-construction monitoring efforts show encouraging results for the water quality and fishery habitat mitigation. Unfortunately, restoring and enlarging fish habitat, wetlands and riparian zones are not common or certain things. Yet with the commitment, help and support of so many people, this enormously popular road project has already become a success.

*Adapted with permission from "Technology Development News," September 1995. ♦*

## News & Views

A trading partnership among the Alaska DOT&PF, the Association of General Contractors, the UAF Transportation Research Center and the Alaska T<sup>2</sup> Program will bring Alaska Transportation Week to the Sheraton Hotel in Anchorage, Alaska April 15-19, 1996. The schedule of events will be as follows:

April 15-16	DOT&PF Construction/Associated General Contractors <i>National Quality Initiative Workshop &amp; General Discussion</i>
April 17	University of Alaska Fairbanks Transportation Research Center <i>Alaska Transportation Forum - Asphalt Issues</i> State and National experts present
April 16-18	Education/Vendor Exhibit Room
April 18	Alaska T <sup>2</sup> Center - Class <i>Pavement Design &amp; Maintenance: Today's Products &amp; Practices, Tomorrow's Potential</i> Includes Superpave, emulsions, load restrictions (including UAF Research & potentially Yukon Transportation), anti-icing (potential presenter from Finland), and potentially a presentation on FHWA's Foreign Technology & Innovations in Snow & Ice Removal (based on a European Tour.)  Early evening: Alaska T <sup>2</sup> Center Advisory Board meeting
April 19	Alaska T <sup>2</sup> Center - Class <i>Pothole Patching - Fix it &amp; Forget It</i> Taught by John Hibbs, Strategic Highway Research Program (SHRP) Implementation Coordinator for T2 Centers: Half day in the classroom, half day hands-on field demos -explains/demonstrates SHRP's recent study on pothole patching (most cost effective techniques, materials, equipment, etc.) Includes spray injection equipment demo and demonstration of local techniques for emergency repair and later in the year "do it right" approach.

*Continued from page 1*

The Alaska Highway was constructed during World War II, originally for military purposes. The road builders in 1942 basically followed the path of least resistance, and as a result the existing highway is narrow and has many geometric deficiencies and structural problems. The reconstructed highway is designed to Transportation Association of Canada standard RAU 100: that is, a two-lane rural road with lane widths of 3.5 m and shoulder of 2.0 m plus a 0.5-m rounding. The design speed is 100 km (60 miles) per hour. The road is surfaced with a bituminous treatment or chipseal. Traffic is light, at approximately 400 vehicles per day. However, there is a relatively high proportion of trucks, tour buses, and large recreational vehicles.

For virtually all of its length, the highway traverses pristine wilderness, and consequently a high priority is placed on minimizing environmental impacts. In addition, the northern section of the highway is located in the discontinuous permafrost zone, a factor which complicates the task of highway engineers and construction contractors. Virtually all north-facing hillsides are permanently frozen, as is the ground underlying the many muskeg and bog-fen complexes along the route. The permafrost at this latitude is relatively warm and is therefore easily destabilized by construction activity. Ice-rich hillsides can quickly become rivers of mud, resulting in greater handling and disposal problems.

The road design incorporates a number of features aimed at mitigating typical permafrost-related highway degradation. One example is the use of side berms on all embankment fills. The function of the berms is to reduce shoulder settlements caused by thawing and consequent foundation weakening at the toe of the embankment. Because the road embankment toe is protected, the worst settlements occur in the berm rather than in the road shoulder. These berms can be constructed from poorer-quality materials which are unsuitable for the actual road subgrade. Furthermore, where settlements do occur, the berm provides a platform for

turbed soil thaws. Culvert locations are also very carefully selected. Where possible, thawed stream channels are used. At unthawed locations, the culvert bed contains a high-density styrofoam insulating layer and riveted steel pipe is used instead of the standard spiral lock to better withstand the stresses related to settlement and frost heaving. Materials that are not susceptible to frost are selected for the upper 0.75 m of the road structure.

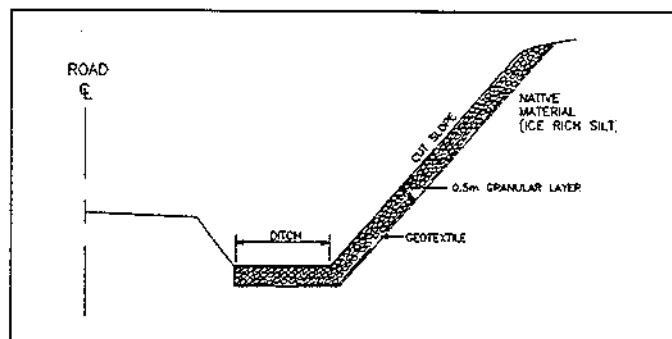
Because of the rugged terrain, excavation volumes are in the order of 150,000 m<sup>3</sup> per kilometer. A significant portion of the roadway excavation is being done during the winter season in order to avoid the handling problems resulting from thawing and associated liquefaction. Waste disposal sites for these materials are selected with close attention to aesthetic and environmental impacts.

Revegetation of these sites will be done soon after construction is complete, to assist stabilization and to mitigate any visual impact.

Despite the numerous challenges associated with the Shakwak project, success is being attained in overcoming problems related to perma-

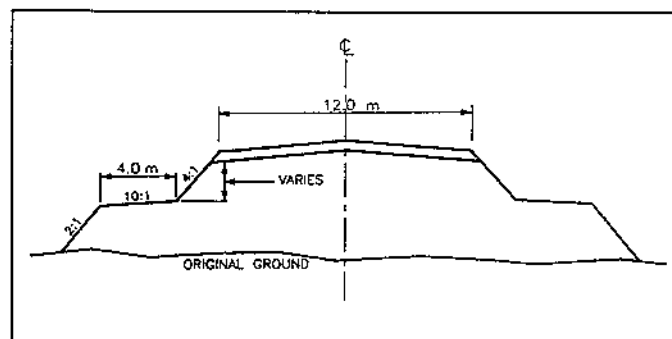
frost. However, it would be unrealistic to expect a completely stable road surface in permafrost terrain, and some settlement will continue to be a fact of life.

*Originally published in "Routes Roads," Number 287, II-1995. Adapted with permission from the Yukon Government, Dept. of Community and Transportation Services. ♦*



*Graphics courtesy of the Yukon Government*

*Right: Side berms, like the ones diagrammed here in a road embankment section help reduce shoulder settlement.*



further embankment without further disturbance of the original terrain.

Another requirement of the design is that all cut slopes in frozen silts be covered with a layer of geotextile and by a 0.5-m deep blanket of granular material such as pit run gravel or shattered rock. This granular blanketing has been very effective in eliminating slope failure caused by piping as the dis-

## Trailer

*Continued from page 1*  
tenance and Operations; George Herrman, DOT&PF Northern Region, Tazlina M&O Area Foreman; George Levasseur, DOT&PF M&O Southcentral District Manager in Valdez; Bill Stanley, Steve Shwartz, and Dave Kozak, Yukon Territory Government Shakwak Projects on the Alaska Highway; Gary Bonham,

Yukon Territory Government Engineering, Whitehorse; Jim Merrill, M&O Chief, Southeast Region; Ron Reitano, Fairbanks M&O Manager, DOT&PF Northern Region; Paul Harker, Federal Highway Administration; and Pete Shook, M&O Manager, Central Region. These people helped make this Alaska T<sup>2</sup> adventure a success. ♦

*The SHRP Work Zone Safety Trailer travelled all over Alaska and part of Canada conducting demonstrations like these pictured on Whitehorse (below) and at the Shakwak Project in the Yukon Territory, Canada (right).*



ALASKA TRANSPORTATION  
**TECHNOLOGY TRANSFER**  
Local Technical Assistance Program  
Department of Transportation and Public Facilities  
2301 Peger Road M/S 2550  
Fairbanks, AK 99709-5399

*address correction requested*

### T<sup>2</sup> Program Staff

**Sharon McLeod-Everette**, SR/WA,  
Director, 907/ 451-5320  
**James L. Bennett, P.E.**, Engineer,  
907/ 451-5322  
**Susan M. Earp**, Clerk/Library  
Coordinator, 907/ 451-5320  
**Marmian Denton**, Newsletter  
Editor, 907/ 451-5321

### T<sup>2</sup> Program Advisory Board

**Martin Ott**, Advisory Board Chair,  
Northern Region DOT&PF  
**Rufus Bunch**, City of Fairbanks  
**Drew Sielbach**, Federal Highway  
Administration  
**Fred Korpinen**, Kenai Peninsula  
Borough  
**George Levasseur**, Southcentral  
District DOT&PF  
**MSgt. David Luera**, Elmendorf AFB  
**Trent Mackey**, Fairbanks North Star  
Borough  
**CMSgt. Craig Powley**, Eielson AFB  
**David Mumford**, Municipality of  
Anchorage  
**Julie Robles**, North Slope Borough  
**Jim Swing**, Matanuska-Susitna  
Borough  
**Matt Reckard**, DOT&PF, Headquar-  
ters  
**Ernie Mueller**, City and Borough of  
Juneau

BULK RATE  
U.S. Postage  
PAID  
Fairbanks, AK  
Permit No. 87



*"Improving Alaska's quality of transportation through technology application, training, and information exchange."*

# Don't replace the rails...Repair them

*Equipment operator designs innovative tool that allows guardrail end recycling*

Sometimes necessity breeds creative solutions.

With the lack of funds a reality, and the guardrails in his area desperately needing replacement, Mark Walker, an equipment operator with the Department of Transportation and Public Facilities at Thompson Pass, came up with an idea that would allow the guardrails to be repaired rather than replaced.

The Thompson Pass and Valdez area has a snow load so great that the ends of the guardrails are buried for most of the winter. The buried ends are nearly impossible to see and are easy to damage with a loader or grader. As a result, the guardrail ends are pretty battered come springtime.

Walker devised a tool that would repair damaged guardrail ends that were not ripped or smashed completely.

The tool is a piece of one-half inch steel formed to the shape of the new guardrail end with a handle that protrudes from the face. It hangs by this handle

when put in position inside the damaged guardrail end. The tool was formed at a local fabrication shop in Valdez.

The repair is accomplished by hanging the tool inside the damaged end, placing two wraps of chain around both the tool and the guardrail end and attaching the other end to a vehicle.

Walker explains that two wraps of chain will prevent the tool from slipping. Also, by placing the hook high or low, you can pull the end up or down to suit the repair. Since some of

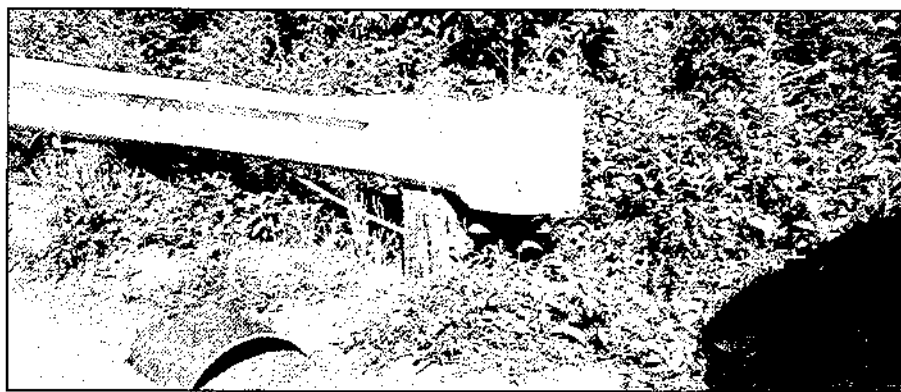
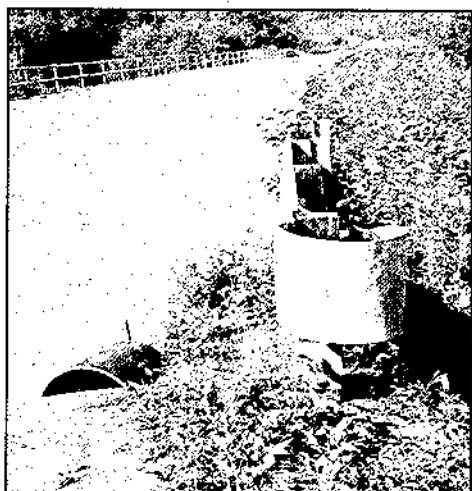
the guardrail ends may be twisted, it is necessary to use a handyman jack to straighten them out.

As the vehicle supplies pressure and begins to pull the end back into shape, a sledge hammer can be used to flatten out any creases and to reset the metal so it retains its shape.

When the operation is complete, the damaged guardrail has been molded back to nearly its new condition, without any replacement of guardrail material.

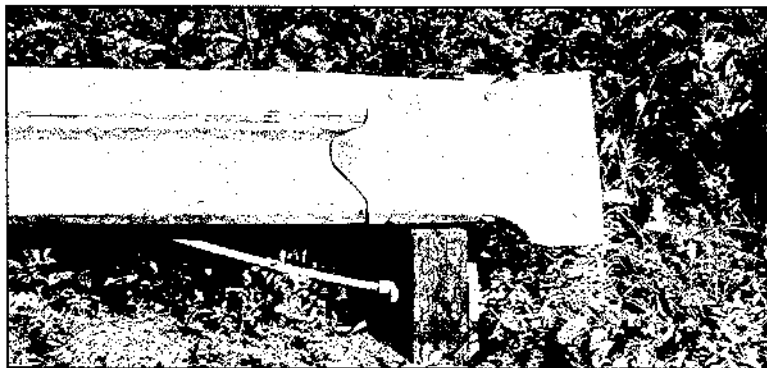
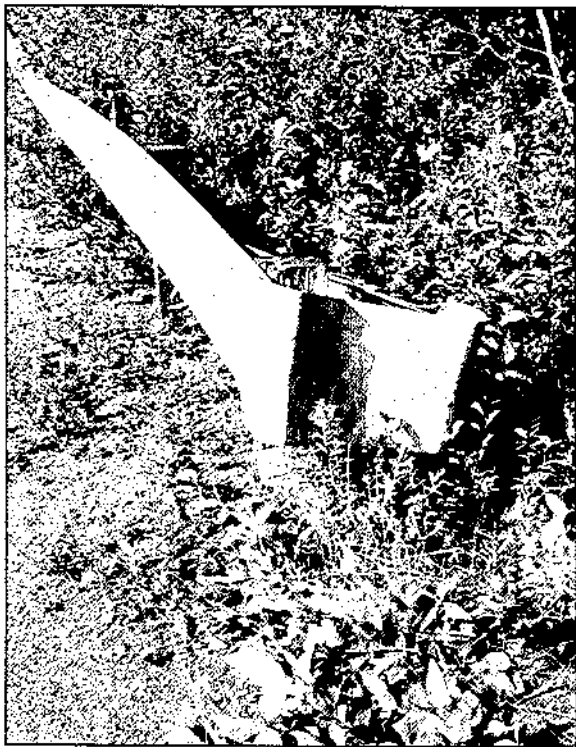


*These photographs show typical damage to the ends of the guardrails in the Thompson Pass and Valdez area.*



*Using the simple tool shown at the bottom left of these photos, the guardrails were restored rather than replaced.*

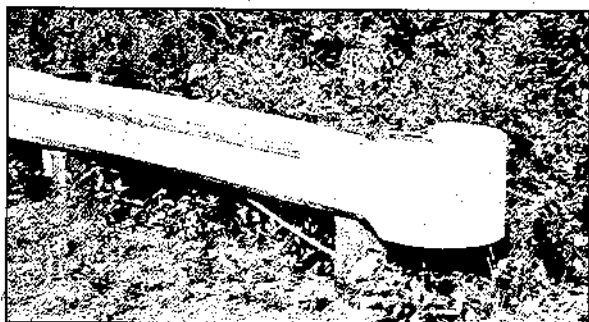
*Below & Right: This guardrail has been damaged and would normally need to be replaced.*



*Far right: A chain is attached to the tool and then to a vehicle.*

*Far bottom right: A worker uses a handyman jack to straighten out a twist in the guardrail end.*

*Right & Below: After a vehicle pulls pressure on the damaged guardrail, and the creases and seams are pounded out, the end piece of the rail is restored to an almost new condition.*



*All photos courtesy of Mark Walker*

### ***For More Information***

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

# Modems bring the world to your desktop

If you haven't thought about buying a modem before, maybe now is the time to find out how this inexpensive device can expand your computer's usefulness and money-saving potential. Take a look at these examples:

- Modems give you access to electronic information services. The SHRP Information Clearinghouse, for example, can offer you a world of transportation related information through your computer.

- Many software companies let you update software simply by calling the company (via modem) and downloading the software upgrade.

- A modem can be your key to Internet electronic mail (e-mail).

## Just what does a modem do?

According to Mike Bugenhagen, systems analyst at the Iowa Transportation Center, a modem is a device that allows computers at different locations to communicate via telephone lines. Modems do this by converting computers' digital signals (electronic pulses of 0's and 1's) to analog signals (continuous waves like sound waves), allowing computers to send signals through the telephone system. Using a modem, a remote computer can connect to a host computer to access information on the host.

A modem is connected to your computer and to a telephone line. To establish connections between your computer and an electronic service, you send commands to the modem via telecommunications software on your computer. The software tells the modem when and what number to dial and what type of translation to use to match the other end.

After dialing, the modem goes into a wait state until it receives a carrier signal from the modem being dialed. Upon receiving the carrier signal, the calling modem establishes connections with the called modem by sending its own carrier signal. Once the two modems have negotiated the same data speed, they will automatically start to translate data from digital to analog and back to digital format, establishing a data link between the two computers.

Some electronic services allow you to transfer files between the service and your own computer. To shorten file transfer time, most modern high-speed modems

compress files before transferring them, allowing the modem to send data faster than the base modem speed.

Because modems are made by many different manufacturers, the industry has developed a standard method for modems to connect and communicate with each other without problems. The standard guarantees that modems manufactured by different companies will work together.

## What features should I look for?

When selecting a modem consider several factors: compatibility, speed, cost, internal versus external modem, and faxing capabilities.

**Compatibility** - Choose a modem that is right for your computer. The modem will say either PC compatible or Mac compatible; most modems come in both models.

If your computer has a serial port, you can connect a modem to it. If you are not sure if you have a serial port, check your manual. Some older computers have "slow" serial ports and may have trouble using today's high speed modems (14.4 baud or faster).

**Speed** - Modem speed indicates how quickly the modem processes or transfers bytes of information. The two most common speeds are 14.4 baud and 28.8 baud - the newest, quickest modem. Slower modems (1,200, 2,400, 4,800 and 9,600 bytes per second) are

still on the market but are becoming obsolete as new standards take hold. Replacing a slower modem can be cost effective because of the potential savings in long distance telephone charges with a high-speed modem.

**Cost** - As a hardware expense, today's fast modems are relatively inexpensive.

14.4 baud modems cost \$100 to \$150 and can download 1 megabyte of compressed files in about 20 minutes.

28.8 baud modems cost \$200 to \$400 can download 1 megabyte of compressed files in only 10 minutes.

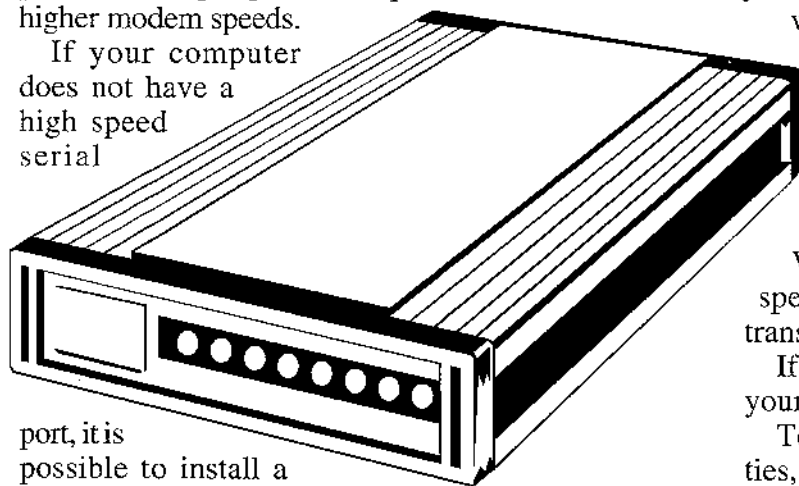
If you use your modem solely for on-line e-mail, choose the 14.4 baud modem. If you plan to transmit many large (especially graphics) files or use a graphics package to access the Internet, the 28.8 baud modem may be the better choice.



**Internal versus external modems** - External modems require a serial port (also called a com port) on your computer. If you don't have a spare serial port, you can either purchase and install a serial port card and use it to connect an external modem, or install an internal modem, which doesn't require a serial port.

**External modems** - Higher speed modems require high-speed serial ports. If you are using a 14.4 or 28.8 baud modem and would like it to be able to compress data, you'll need a high-speed serial port. Most new computers have high-speed serial ports that will handle the higher modem speeds.

If your computer does not have a high speed serial



port, it is possible to install a high speed serial port card in your computer.

**Internal modems** - Internal modems are attractive because they avoid the entire issue of serial ports. Many new computers are available with internal modems already installed. You can install an internal modem if your computer has an open card slot, or bay, for the modem card. If you install an internal modem, make sure no device like a mouse is on the corresponding odd or even numbered serial port. (Although installing a modem doesn't require a spare port, the internal modem will still have a serial port address.)

If you haven't ventured inside your computer once or twice already, you may want a computer technician to install your high-speed serial port or internal modem. Some computer stores will install ports and internal modems at no cost if you have purchased the modem or serial port card from them, but always check first.

**Fax compatible modems** - Before you buy a modem consider if you're also in the market for a new or upgraded fax machine. A fax-compatible modem, in addition to its modem capabilities, can send and receive faxes. According to the May 1995 issue of *PC Computing*, fax compatible modems have many advantages over regular fax machines and do not cost much more than regular modems (\$10 to \$25 more).

The new fax-compatible modems are nearly twice as fast as a regular fax machine. The quality of the fax print-out is superior because the modem eliminates the need

for scanning. When built into a laptop computer, fax-compatible modems are more portable than regular fax machines, and fax compatible modems are more effective for multiple addressees. Perhaps more important, with special fax software, the faxes you receive via a fax-compatible modem can be converted from images to computer files, allowing you to print and/or edit them with your word processor.

### Do I need anything else?

You need telecommunications software installed on your computer to use your modem. The type of software depends on what you want to do. Generally, if you just want to call an electronic service, any general communications software program will work. Most of these programs take advantage of your modem's highest speed capability and enable users to view color screens. You can use the bare-bones MS Windows terminal program, but it doesn't offer speed and color enhancements or easy-to-use file transfer methods.

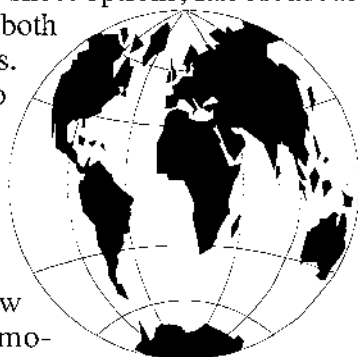
If you want to set up an on-line electronic service yourself, you need special bulletin board software.

To use a fax-compatible modem's faxing capabilities, you also need fax software. Most fax software lets you compose your document using your favorite word processing program; you can even include graphics. Then you print the document to a special "printer," which is really the fax software. At that point, the software changes the print job into a fax.

Some general telecommunications packages offer faxing capability and generally function well, but they do not offer as many features as special fax programs. Programs like Delrina's Winfax Pro offer fully enhanced faxing capabilities for documents you compose with word processing software, and feature capabilities such as cover sheet options, fax broadcasting and scheduling, and both send and receive modes.

Most fax packages also let you translate a graphic fax image received by your computer into text so you can edit it.

Like any other new hardware purchase, modems require some time and patience to install or connect and to get comfortable with, but in return, they offer you the world.



*Adapted with permission from "Technology News," June 1995, Iowa Transportation Center.*

### For More Information

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

**Metric Brain Teasers**

by Gene Rehfield

State Metric Coordinator

These questions will challenge your use of some basic (and not so basic) units of measurement in the metric system. They were taken from a quiz developed as part of the NHI course 12301 Metric (SI) Training for Highway Agencies.

**Useful Conversion Factors:****Length, Area, and Volume Conversion Factors**

Quantity	From Inch-Pound Units	To Metric Units	Multiply by*
Length	mile	km	<u>1.609 344</u>
	yard	m	<u>0.914 4</u>
	foot	m	<u>0.304 8</u>
Volume	cubic yard	m <sup>3</sup>	0.764 6
	cubic foot	m <sup>3</sup>	0.028 32
	gallon	L (1000 cm <sup>3</sup> )	3.785
	cubic inch	cm <sup>3</sup>	<u>16.387 064</u>

\*Note: Underline denotes exact number

**Civil and Structural Engineering Conversion Factors**

Quantity	From Inch-Pound Units	To Metric Units	Multiply by
Force	lb	n	4.448
	kip	kN	4.448

**Questions:*****True or False:***

1. The metric system is in use in the United States today.
2. The liter is slightly larger than a quart.
3. Speed limits will increase considerably as a result of metric conversion.
4. The price of gasoline will decrease as a result of metric conversion.

**Multiple Choice:**

5. How many meters in a 402 foot home run to center field?
- a. 122
  - b. 122.5
  - c. 123
  - d. 121.5
  - e. 121
6. What force of gravity (newtons) is generated by a 14-pound bowling ball?
- a. 62 n
  - b. 6.4 n
  - c. 60 n
  - d. 6.0 n
  - e. 140 n
7. What is the hard conversion of the Indianapolis 500 from English (miles) to SI (km)?
- a. Indianapolis 310
  - b. Indianapolis 800
  - c. Indianapolis 300
  - d. Indianapolis 805
  - e. Indianapolis 500
8. Perform a conversion to SI of the following quantity: nine yards.
- a. 9 y
  - b. 10 m
  - c. 8 m
  - d. 8.23 m
  - e. 9 m

**Quiz Solutions:**

- |      |      |      |
|------|------|------|
| 1. T | 4. F | 7. b |
| 2. T | 5. c | 8. d |
| 3. F | 6. a | 9. c |

The Alaska DOT & PF Metric Practice Guide contains all of these conversions and many more. It will be available following review and approval by FHWA, which is currently in process.

*See you next issue.*

**For More Information**

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

# NQI: a nationwide cooperative effort

Building roads and bridges of quality has always depended on the individual integrity and commitment of practitioners in both government and industry. Heading into the 21st century, transportation professionals now recognize that producing quality highway products requires the same integrity coupled with a joint commitment among the various agents and their organization members.

What is so different about this new dialogue on quality? Haven't we always worked to develop and provide high caliber materials and workmanship? Haven't we always been dedicated to infrastructure which was designed for safety, long life and low maintenance? Of course! But now we have available substantial refinements in the manner in which we can assure quality.

The new dialogue is about Continuous Quality Improvement, a philosophy which identifies management techniques designed to prevent inefficiencies and defects. These techniques are suitable for use in any phase of the developing construction process, beginning with planning and design, through contracting, then into construction and finally maintenance and operations. In some of the literature you may see this management philosophy referred to as Total Quality, Total Quality Management, Quality Improvement or Continuous Quality Improvement. The approach is continually being repackaged and adapted to emphasize somewhat different philosophies or techniques, de-

pending on the type of enterprise. However, whatever the nomenclature, they all share an appreciation for redefining quality as a process-oriented rather than object oriented management philosophy geared at improving products and services while satisfying the customer and reducing waste.

In preparation for understanding this new approach to quality, let's review a few of the more significant programs and activities which have evolved into a nationwide em-

brace of Continuous Quality Improvement in the highway transportation industry.

## Malcolm Baldrige National Quality Award

On August 20, 1987, President Ronald Reagan signed Public Law 100-107, the statute which established the Malcolm Baldrige National Quality Award. This is an annual tribute given to up to six companies which have successfully implemented quality management systems. In 1992, the first highway construction related firm, Granite Rock of Watsonville, California, received the award in the small business category.

## American Society of Civil Engineers "Quality in the Constructed Project, Volume 1"

In 1988, the American Society of Civil Engineers published a comprehensive guide for owners, design professionals, constructors and others on principles and procedures for managing quality on the constructed project. It provides guidance on roles and responsibilities of the various parties to a project contract and describes a desirable process for the project delivery from conception through design, construction and operations start-up.

## American Consulting Engineers Council (ACEC)

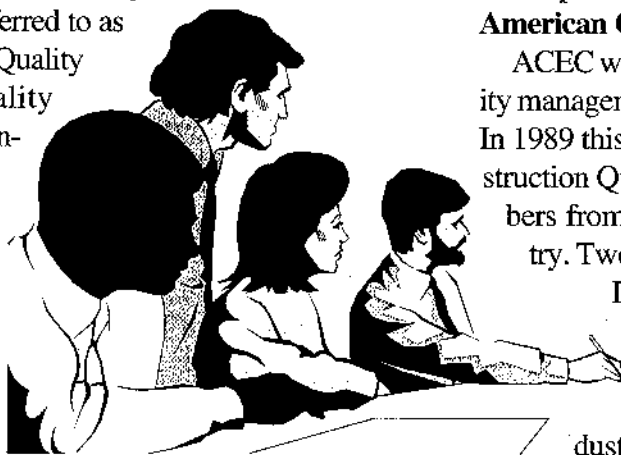
ACEC was an early leader in fostering interest in quality management in the design and construction industry. In 1989 this organization founded the Design and Construction Quality Institute (DCQI), comprised of members from all stakeholders in the construction industry. Two years later DCQI produced its first issue of

DCQ Forum, a quarterly publication devoted to disseminating largely practical information about Total Quality Management in the industry.

In early 1993, DCQI was recognized as an independent entity.

## European Asphalt Study Tour

The issue of quality in the highway industry was highlighted with the 1990 European Asphalt Study Tour. Officials from U.S. federal and state governments, as well as representatives from the industry, travelled to six European countries to study asphalt paving technologies used overseas. This investigation helped to shape the emphasis for formalizing a U.S. policy initiative on quality for highways.



**Alaska Transportation Technology Transfer Program**

**National Quality Initiative**

## **FHWA Demonstration Project No. 89: "Quality Management"**

In December 1990, under DP-89, The Federal Highway Administration sponsored a workshop on improving the quality of highway products. The workshop was attended by top management from the highway community, whose assignment was to identify actions to improve quality. With broad representation from the state highway administrations, the construction industry, construction associations, academia and the Federal Highway Administration, the concept of "partnerships in quality" was set in motion.

### **National Quality Initiative**

The concept of "partnerships in quality" was formalized by the creation of a National Quality Initiative (NQI), described in a memorandum dated June 24, 1992 from the then FHWA Administrator, Dr. Thomas Larson. This communication details the role of the Federal Highway Administration in defining this initiative and in offering other FHWA support activities to advance quality practices in the federal government.

The National Quality Initiative entailed the formation of an NQI Steering Committee by AASHTO in 1991, with membership from the Federal Highway Administration (FHWA), American Association of State Highway and Transportation Officials (AASHTO), and six industry organizations: American Road and Transportation Builders Association (ARTBA), Associated General Contractors of America (AGC), American Concrete Pavement Association (ACPA), National Asphalt Pavement Association (NAPA), American Consulting Engineers Council (ACEC), and National Ready Mixed Concrete Association. The mission of the Steering Committee is to solidify this partnership and the commitment to quality through policy development, training and technical support. The first four items on its agenda included: 1) the drafting of a "National Policy on the Quality of Highways," 2) the sponsoring of a one-day "National Quality Seminar" for top management in the transportation industry; 3) the support for a series of four regional seminars on quality; and 4) the conduct of a series of technical support activities. In 1993, the American Public Works Association (APWA) joined the NQI Steering Committee.

### **1993 AASHTO Commitment**

AASHTO's interest in promoting quality in the development of highway products has been reflected in a number of its programs. In 1992, the newly-elected AASHTO president Wayne Muri, Chief Engineer with the Missouri Highway and Transportation Department, issued a memorandum

which was adopted by the AASHTO Board of Directors, formalizing this agency's position on quality in transportation. The memorandum stated that for 1993 the topic of "Quality" would serve as the single area of emphasis for AASHTO's Chief Executive Officer.

### **National Policy on the Quality of Highways**

This document was crafted jointly by members of the National Quality Initiative Steering Committee for the purpose of establishing a partnership among highway stakeholders in the public and private sectors. The policy document calls for a commitment to quality products, information and services through the cooperative efforts of transportation professionals in the areas of product construction and maintenance; research and technology; flexibility and responsibility; assurances; incentives; and quality management systems. On Nov. 10, 1992, at the National Quality Seminar, "Partnerships for Quality," this document was signed by representatives of the original eight organizations involved in its creation.

### **NQI "Partnerships for Quality" Seminar**

On Nov. 10, 1992, in Dallas-Fort Worth, Texas, the first National Quality Seminar was held for top management persons responsible for highways in the various levels of government, industry, academia and research institutions. The seminar embraced the theme "Partnerships for Quality," and was designed to rally support from top leaders in the transportation community and to raise consciousness about a nationwide, industry-wide commitment to quality. The two major components of the seminar program were a discussion of some of the fundamentals of existing structured quality improvement programs and the signing of the National Policy on the Quality of Highways.

This event was the official launching of the "partnerships in quality" philosophy in the highway community. It was also the launching of the first in a series of training/educational programs developed under the auspices of the National Quality Initiative to provide transportation professionals with the incentives and tools to translate the quality message into quality management.

To maintain and extend quality and productivity in our organizations, we need to have state-of-the-art management as well as state-of-the-art technology. In the 1990's, a commitment to quality management starts with a commitment to learning more about Continuous Quality Improvement.

*Excerpted and abridged from "Quality Improvement Resource Guide," Federal Highway Administration publication No. FHWA-SA-94-002, October 1993.*

### **For More Information**

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

# ***New Publications Available for Loan*** \_\_\_\_\_ **1995**

No. 40

- \_\_\_\_ **1994 Driver License Administration Requirements and Fees**, ID-1339, U.S. Dept. of Transportation, Federal Highway Administration, FHWA-PL-94-030, 1994, 35pp.
- \_\_\_\_ **Artificial Intelligence for Transit Railcar Diagnostics, TCRP Report 1**, ID-1336, The Federal Transit Administration, Report 1, 1994, 55pp.
- \_\_\_\_ **Control of Musk Thistle (*Carduus Nutans* L.) with Transline and Escort Along Roadsides**, ID-1354, Texas Transportation Institute, Texas Department of Transportation, TTI:7-902, 1994, 32pp.
- \_\_\_\_ **Coordination of Actuated Controllers on Traffic Control Systems**, ID-1359, Texas Transportation Institute, Texas Department of Transportation, TTI:0-1255, 1994, 128pp.
- \_\_\_\_ **Corridor Preservation, A Synthesis of Highway Practice**, ID-1338, Transportation Research Board, NCHRP Synthesis 197, 1994, 43pp.
- \_\_\_\_ **Criteria for Qualifying Contractors for Bidding Purposes**, ID-1357, NCHRP Synthesis 190, Transportation Research Board, National Research Council, NCHRP Synthesis 190, 1994, 40pp.
- \_\_\_\_ **Diametral Tests for Bituminous Mixtures**, ID-1337, U.S. Dept. of Transportation, Federal Highway Administration, FHWA-RD-91-083, 1992, 137pp.
- \_\_\_\_ **Evaluation of Agents for Lubrication and Temporary Corrosion Protection of Post-Tension Tendons**, ID-1355, Center for Transportation Research, The University of Texas at Austin, CTR 0-1264-1, 1993, 120pp.
- \_\_\_\_ **Evaluation of Novachip™ Construction Report**, ID-1360, Texas Transportation Institute, Texas Department of Transportation, TTI:9-553, 1994, 73pp.
- \_\_\_\_ **Evaluation of the Southwest Freeway Motorist Assistance Program in Houston**, ID-1348, Texas Transportation Institute, Texas Department of Transportation, TTI:7-1922, 1993, 36pp.
- \_\_\_\_ **FWD-DYN: A Computer Program for Forward Analysis and Inversion of Falling Weight Deflection Data**, ID-1343, U. of Texas, Center for Transportation Research, CTR 7-1970-1F, 1993, 88pp.
- \_\_\_\_ **Graphically-Oriented Analysis of Post-Tensioned Slab Bridges on Microcomputers**, ID-1347, Texas Transportation Institute, Texas Department of Transportation, TTI:2-5-88\0-1182, 1994, 117pp.
- \_\_\_\_ **Guideline for Asphalt Refiners and Suppliers**, ID-1361, Strategic Highway Research Program, National Research Council, SHRP-A-686, 1994, 52pp.
- \_\_\_\_ **Hot In-Place Recycling of Asphalt Concrete**, ID-1352, NCHRP Synthesis 193, Transportation Research Board, NCHRP Synthesis 193, 1994, 69pp.
- \_\_\_\_ **Interim Program Documentation on System Ramp Control A Optimization Algorithms**, ID-1333, Texas Transportation Institute, TTI:0-1232, 1994, 99pp.
- \_\_\_\_ **Laboratory Evaluation of Crumb-Rubber Modified (CRM) Binders and Mixtures**, ID-1334, Texas Transportation Institute, TTI:0-1332, 1993, 243pp.
- \_\_\_\_ **Manual for the Interactive Training System for Texas Travel Models**, ID-1340, Texas Transportation Institute, TTI:7-947, 1994, 54pp.
- \_\_\_\_ **Models of Pedestrian Crossing Behavior at Signalized Intersections**, ID-1350, Center for Transportation Research, The University of Texas at Austin, CTR 0-1296-1, 1994, 104pp.

*Alaska Transportation Technology Transfer Program*

*Notes on Publications and Videos*

\_\_\_\_ **Multimodal Priority Setting and Application of Geographic Information Systems**, ID-1356, Transportation Research Record No. 1429, Transportation Research Board, National Research Council, TRR No. 1429, 1994, 89pp.

\_\_\_\_ **Overview of the Texas-Mexico Border: Assessment of Traffic Flow Patterns**, ID-1349, Center for Transportation Research, The University of Texas at Austin, CTR 7-1976-3, 1994, 196pp.

\_\_\_\_ **Overview of the Texas-Mexico Border: Background**, ID-1345, Center for Transportation Research, The University of Texas at Austin, CTR 7-1976-1, 1994, 162pp.

\_\_\_\_ **Overview of the Texas-Mexico Border: Data Base**, ID-1346, Center for Transportation Research, The University of Texas at Austin, CRT 7-1976-2, 1993, 188pp.

\_\_\_\_ **Pavement and Traffic Monitoring and Evaluation, No. 1435, Pavement Design, Management, and Performance**, ID-1344, Transportation Research Board, National Research Council, No. 1435, 1994, 187pp.

\_\_\_\_ **Public Outreach Handbook for Departments of Transportation**, ID-1332, NCHRP report Transportation Research Board, 1994, 37pp.

\_\_\_\_ **Reducing Friction Losses in Monolithic and Segmental Bridge Tendons**, ID-1353, Center for Transportation Research, The University of Texas at Austin, CTR 0-1264-2, 1993, 134pp.

\_\_\_\_ **A Simplified Field Method for Capacity Evaluation of Driven Piles**, ID-1335, U.S. Dept. of Transportation, Federal Highway Administration, FHWA-RD-94-042, 1994, 291pp.

\_\_\_\_ **Trends in Urban Roadway Congestion-1982 to 1991, Volume 1: Annual Report**, ID-1342, Texas Transportation Institute, TTI:0-1131, 1994, 86pp.

\_\_\_\_ **Trends in Urban Roadway Congestion-1982 to 1991, Volume 2: Methodology and Urbanized Area Data**, ID-1341, Texas Transportation Institute, TTI:0-1131, 1994, 184pp.

\_\_\_\_ **U.S. 75 North Central Expressway Reconstruction: Lemmon\Oak Lawn\Peak Screen Line Automobile User Panel, October 1993 Survey Results**, ID-1358, Texas Transportation Institute, Texas Department of Transportation, TTI:7-1994, 1994, 38pp.

\_\_\_\_ **Underwater Bridge Maintenance and Repair**, ID-1351, NCHRP Synthesis 200, Transportation Research Board, NCHRP Synthesis 200, 1994, 54pp.

These publications may be borrowed for three weeks. However, if you need the materials longer, just contact our office for an extension. Questions? Contact **Susan Earp** at (907) 451-5320 or TDD: (907) 451-2363.

**Please print your name and address below, and mail or fax to:**

**Alaska Transportation Technology Transfer Program  
Local Technical Assistance Program  
Department of Transportation and Public Facilities  
2301 Peger Road M/S 2550  
Fairbanks, AK 99709-5399  
FAX: (907) 451-2313**

Name: \_\_\_\_\_ Title: \_\_\_\_\_ M/S: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State/Province: \_\_\_\_\_ Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

### ***For More Information***

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.

Place a check by the videotapes you wish to borrow.

- \_\_\_ **Communication Across Cultures: The Clash of Worlds**, ID-300, KTOO-TV, 1994. Closed Caption.
- \_\_\_ **Communication Across Cultures: The Old Wisdom-Traditional Cultures**, ID-299, KTOO-TV, 1994. Closed Caption.
- \_\_\_ **Communication Across Cultures: Our World - The Global-Literate Culture**, ID-298, KTOO-TV, 1994. Closed Caption.
- \_\_\_ **Communication Across Cultures: The Universe of Communication**, ID-301, KTOO-TV, 1994. Closed Caption.

## ADDITIONAL PUBLICATIONS AVAILABLE FOR LOAN

Place a check by the publications you wish to borrow.

- \_\_\_ **Asphalt Concrete Synthetic Reference Sample Program and the LTPP Asphalt Concrete Core Proficiency Sample Program**, ID-1364, Strategic Highway Research Program, National Research Council, SHRP-P-690, 1994, 123pp.
- \_\_\_ **Cost-Effective Geometric Improvements for Safety Upgrading of Horizontal Curves**, ID-1380, U.S.D.O.T., Federal Highway Administration, FHWA-RD-90-021, 1991, 237pp.
- \_\_\_ **Design and Evaluation of Rigid and Flexible Pavements 1990**, ID-1379, Transportation Research Record No.1286, Transportation Research Board, National Research Council, No. 1286, 1990, 269pp.
- \_\_\_ **Development and Use of the Repeated Shear Test (Constant Height): An Optional SUPERPAVE Mix Design Tool**, ID-1366, Strategic Highway Research Program, National Research Council, SHRP-A-698, 1994, 110pp.
- \_\_\_ **Early Analyses of LTPP General Pavement Studies Data: Data Processing and Evaluation**, ID-1372, Strategic Highway Research Program, National Research Council, SHRP-P-684, 1994, 284pp.
- \_\_\_ **The Elimination or Mitigation of Hazards Associated With Pavement Edge Dropoffs During Roadway Resurfacing**, ID-1373, AAA Foundation for Traffic Safety, University of Tennessee, Knoxville, 1994, 24pp.
- \_\_\_ **Evaluation of a Time Domain Reflectometry Technique for Seasonal Monitoring of Soil Moisture Content Under Road Pavement Test Sections**, ID-1363, Strategic Highway Research Program, National Research Council, SHRP-P-689, 1994, 193pp.
- \_\_\_ **Minnesota Road Research Project: Load Response Instrumentation Installation and Testing Procedures**, ID-1375, Minnesota D.O.T., 94-01, MN\PR-94\01, 1994, 75pp.
- \_\_\_ **Performance Prediction Models In the SUPERPAVE Mix Design System**, ID-1367, Strategic Highway Research Program, National Research Council, SHRP-A-699, 1994, 94pp.
- \_\_\_ **Recycling and Use of Waste Materials and By-Products in Highway Construction, A Synthesis of Highway Practice**, ID-1377, NCHRP Synthesis 199, Transportation Research Board, National Research Council, NCHRP Synthesis 199, 1994, 88pp.
- \_\_\_ **Round 1 Hot Mix Asphalt Laboratory Molded Proficiency Sample Program**, Strategic Highway Research Program, ID-1365, National Research Council, SHRP-P-691, 1994, 99pp.
- \_\_\_ **Round 1 Type 1 Unbound Granular Base Course Proficiency Sample Program**, ID-1368, Strategic Highway Research Program, National Research Council, SHRP-P-692, 1994, 122pp.

\_\_\_\_ **Safety Effects of Cross-Section Design for Two-Lane Roads, Vol. 1, Final Report**, ID-1383, Federal Highway Administration, FHWA-RD-87\008, 1987, 194pp.

\_\_\_\_ **SHRP-LTPP Data Analysis Studies: Five-Year Report**, ID-1362, Strategic Highway Research Program, National Research Council, SHRP-P-688, 1994, 102pp.

\_\_\_\_ **SHRP-LTPP Materials Characterization: Five-Year Report**, ID-1361, Strategic Highway Research Program, National Research Council, SHRP-P-687, 1994, 174pp.

\_\_\_\_ **SHRP-LTPP Monitoring Data: Five-Year Report**, ID-1371, Strategic Highway Research Program, National Research Council, SHRP-P-696

\_\_\_\_ **Soil Nailing Field Inspectors Manual, Soil Nail Walls-Demonstration Project 103**, ID-1381, U.S.D.O.T., Federal Highway Administration, FHWA-SA-93-068, 1994, 114pp.

\_\_\_\_ **Soil Nailing Recommendations-1991, For Designing, Calculating, Constructing and Inspecting Earth Support Systems Using Soil Nailing**, ID-1382, English Translation, French National Research, FHWA-SA-93-026, 1993, 321pp.

\_\_\_\_ **Structural Response to Long-Duration Earthquakes, Final Technical Report**, ID-1376, Washington State D.O.T., WA-RD 340.2, 1994, 192pp.

\_\_\_\_ **Summary Report- Western States Drainable PCC Pavement Workshop, California Department of Transportation**, ID-1374, Federal Highway Administration, USDOT, FHWA-SA-94-045, 1993, 166pp.

\_\_\_\_ **TDM Innovation and Research Symposium, Steering a Strategic Agenda for the Future**, ID-1384, Transportation Research Board, National Research Council, Circular No. 433, 1994, 150pp.

\_\_\_\_ **Techniques for Estimating Flood-Peak Discharges of Rural, Unregulated Streams in Ohio**, ID-1378, Ohio D.O.T., U.S. D.O.T., U.S. Geological Survey, Water-Resources Investigations Report 89-4126, FHWA\OH-90\01, 1990, 68pp.

\_\_\_\_ **Type I Unbound Granular Base Synthetic Reference Sample Program**, ID-1370, Strategic Highway Research Program, National Research Council, SHRP-P-694, 1994, 110pp.

\_\_\_\_ **Type II Unbound Cohesive Subgrade Soil Synthetic Reference Sample Program**, ID-1369, Strategic Highway Research Program, National Research Council, SHRP-P-693, 1994, 109pp.

These videotapes and publications may be borrowed for three weeks. However, if you need the materials longer, just contact our office for an extension. Questions? Contact **Susan Earp** at (907) 451-5320 or TDD: (907) 451-2363.

**Please print your name and address below, and mail or fax to:**

**Alaska Transportation Technology Transfer Program  
Local Technical Assistance Program  
Department of Transportation and Public Facilities  
2301 Peger Road M/S 2550  
Fairbanks, AK 99709-5399  
FAX: (907) 451-2313**

Name: \_\_\_\_\_ Title: \_\_\_\_\_ M/S: \_\_\_\_\_  
Organization: \_\_\_\_\_  
Address: \_\_\_\_\_  
City: \_\_\_\_\_ State/Province: \_\_\_\_\_ Zip: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

#### ***For More Information***

For back issues of our newsletter and inserts, or to get on our mailing list, write: Alaska Transportation Technology Transfer Program, Department of Transportation and Public Facilities, 2301 Peger Road, M/S 2550, Fairbanks, Alaska 99709-5399. For more information, you can also call (907) 451-5320.



## Alaska DOT & PF Research Reports

### *Field and Laboratory Investigation of Bridge Abutment*, SPF-UAF-92-2, R.F. Carlson, G. Scarbrough, J. Harping.

The authors investigate a new prediction technique for evaluating channel scour at bridge abutments. This new technique uses a method that depends on simple fluid principles of uniform horizontal shear distribution, numerical solution of Laplace equation for two dimensional flow around bridge abutments, adjustment of the empirical parameters by comparison to laboratory measurements, and the assumption of a fully mobile bed sediment movement. The results of two field case studies are also included in this report.

### *Managing Roadside Vegetation in Alaska*, SPR-UAF-92-11, Lawrence A. Johnson.

This report examines the problem of controlling undesirable roadside vegetation, primarily tall wood shrubs and trees, in the central and northern districts of Alaska. It examines a number of different methods that have been used in the past, such as the use of herbicides, mechanical cutting of the vegetation, and combinations of these. A recommendation for an integrated vegetation management system is made.

### *Performance of Traffic Markings in Cold Regions*, INE/TRC 95.03, Jian John Lu.

A study was conducted on the performance of traffic marking materials used in Alaska and other northwestern states. The results summarized in this report include impacts of pavement marking patterns on a driver's behavior, reflectivity performance, a general evaluation of traffic marking materials, as well as other items. The traffic marking types evaluated in this study include traffic paint, thermoplastics, preformed tapes, and Methyl Methacrylate, all of which have been used in Alaska.

### *Winter Vehicle Traction and Controllability Performance*, INE/TRC 95.04, Jian John Lu.

This study investigates the traction performance of different types of winter tires. The field tests were performed in test sites on traveling roadways and parking lots. The main traction performance measurements used included stopping distances, the maximum stopping G-forces (acceleration forces), the tire necessary to reach a certain speed, the maximum starting G-forces, the maximum directional change degree, and the maximum lateral displacement.

### *Determination of Snow Melt Flood Peaks for Highway Drainage Design*, SPR-UAF-92-2, Robert F. Carlson.

Highway designers need an accurate estimate of spring runoff flow in order to provide for adequate drainage capacity in culverts and small bridges. This study focused on several alternative ways to estimate the spring runoff flow, two of which ranked higher in effectiveness than the others. The first method tabulates the peak of the first significant rise in the stream hydrograph during the spring season. The second method selects a peak flow that occurs any time during the spring quarter months of April, May or June.

### *Equipment Bid Awards: Initial Cost versus Life Cycle Cost*, SPR-UAF-92-20, E. Baker IV and L. Chen.

The cost of operating and maintaining equipment frequently exceeds the purchase cost of the equipment itself and varies widely between functionally equivalent candidates. But, most public organizations must award a bid based only on lowest initial cost bid. This report looks into the process of life cycle cost (LCC) bidding and how it could be implemented in the DOT&PF.

### *Permafrost Database, 1994*, SPF-UAF-94-17, J. Leroy Hulsey.

This report details repairs and readings from eight different permafrost sub-surface temperature data gathering sites. It provides sub-surface temperature profiles for the 1994 spring and fall readings.

### *Evaluating of Saturation Sensor Probe*, SPR-UAF-92-22-C, Jian John Lu

This report provides evaluation of the device called the Soil Sensor Probe, which was developed to monitor the moisture content of any given pavement structure system. The soils that the probe was tested on included open grounded gravel (1 inch maximum aggregate size), sandy gravel (D1), and silt.

### *Yukon River Bridge, Deck Strains and Surfacing Alternatives*, SPR-UAF-92-6, J.L. Hulsey, L. Yang, Kevin Curtis, and L. Raad.

This report examines the difficulties in choosing a wearing surface for the Yukon River bridge and other similar bridges. Also included are charts that can help engineers and suppliers select an alternative wearing surface.

For more information contact UAF's Transportation Research Center at 474-7497. Please refer to the report number and title.



## Texas Transportation Institute Research Reports

**Short Term  
Guidelines to  
Improve Crumb**

**Rubber Modified Asphalt Concrete Pavements**, FHWA/TX-95/1332-2F, S. Rebala, C.K. Estakhri, M. Gownder, and D. Little.

This report presents guidelines, draft material specifications and test protocol regarding the use of crumb rubber modifier in asphalt concrete pavements. Researchers found that CRM has the potential to improve the fatigue and thermal cracking performance of asphalt concrete pavements. Performance of crumb rubber modified asphalt concrete pavements is predicted using the Texas Flexible Pavement System (TFPS). Pavements were analyzed under a variety of climatic and structural conditions.

**TRIPCAL5 Documentation Manual, Revised Edition**, FHWA/TX-95/1235-6, D.F. Pearson, C.E. Bell, and G.B. Dresser.

This manual is designed to provide technical documentation for the trip generation program TRIPCAL5. It was originally published in February 1992 and is published here in revised form to include documentation on the default models. This documentation is presented as a technical appendix.

**Enhancing Transit Communication in Texas**, TX-95/1974-2F, K.F. Turnbull, L.L. Higgins, and J. Ricci.



This report documents a study of the roles and responsibilities of the various agencies and groups responsible for planning, funding, and operating public transit services in Texas. In addition, the study examined the relationships among these agencies and explored methods and techniques used to communicate among these diverse groups. The current communication approaches used in Texas are identified, along with methods used in other states. Examples of innovative practices and approaches are highlighted in short case studies, and possible ways to enhance the interaction among the groups responsible for planning, funding, and operating transit services are outlined.

**Effective Placement of Detectors at Diamond Interchanges**, FHWA/TX-95/1392-4, D. Prabhakar, C.J. Messer, and D.L. Woods.

This report summarizes the results of a study of detector placement on the diamond interchange frontage road (ramp) using the Texas Intersection Simulation Model. The criterion used for the optimization is the minimization of delay. A secondary criterion is to reduce the dilemma zone to a minimum.

**Analysis of the Visual Character of the Major Highway Corridors of El Paso, Texas**, TX-95/944-2, J.R. Schutt and T. Larsen.



The goal of this study is to describe the visual character of the highway corridors, to identify the major visual problems and resources, and to suggest ways of addressing these issues in future projects. Data for this study was gathered by field study of the highways and in-depth interviews with a small group of El Paso residents.

**Development of Emission Estimates for the Conformity Analysis of the JOHRTS FY-94 TIP and MTP**, FHWA/TX-95/1375-6, C.E. Bell, J.D. Benson, and G.B. Dresser.

This report documents the mobile source emission estimation methodology used for the conformity analyses of the Transportation Improvement Program (TIP) and the metropolitan transportation plan (MTP) for Jefferson and Orange Counties and portions of Hardin County. Included in the report is a brief overview of the emission estimation methodology and the 24-hour traffic assignments used in the analyses; the methods used to estimate the seasonally adjusted time-off-day vehicle miles of travel and associated operating speeds; the estimation of the emission rates using the EPA's MOBILE5a program; and brief outlines of the method used to develop the emission estimates using the MOBILE5a emission rates and comparisons of the emission estimates for the Build and No-Build Options.

**El Paso TIP and MTP 1995-2015 Conformity Analysis**, FHWA/TX-95/1375-5, J.D. Benson, G.B. Dresser, and C.E. Bell.

This report presents conformity analysis information for the El Paso area.

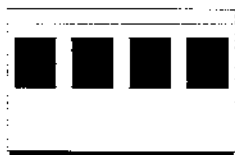
**Assistance with the Federal High-Speed Rail Corridor Application Process**, TX-94/2907-1F, S.S. Roop and R.W. Dickinson.

A workplan was developed for a feasibility study of possible high-speed rail corridors in Texas. This workplan will serve as the core document in any petition submitted to the Secretary of Transportation, and will



represent the expected deliverables from contractors in a potential Request for Proposal issue from TxDOT.

**Installation and Training for the District 21 (Pharr) Pavement Management System**, TX-95/900-2F, Don Smith.



This project pertains to the design and implementation of a microcomputer database system to interface with the current TxDOT statewide mainframe PMIS system.

This effort, conducted over a five year period, has produced a now operational DOS/Windows-based system to download data and pavement scores from the TxDOT mainframe system in Austin, Texas.

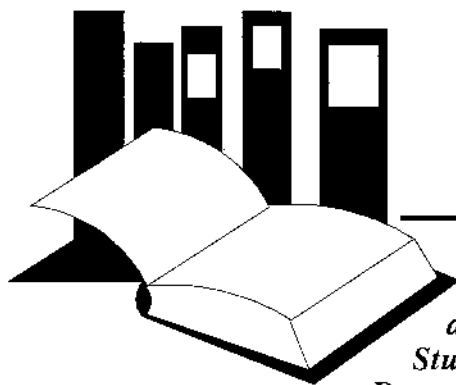
**The Performance of Flexible Erosion Control Materials and Hydraulic Mulches**, TX-95/1914-2, S.H. Godfrey, J.P. Long, J.A. McFalls.

The TTI/TxDOT Hydraulics and Erosion Control Laboratory conducted a series of evaluation procedures to determine the field performance of flexible erosion control materials. The objectives of the study included determining the effect of flexible materials on the ger-

mination and growth of native grasses and evaluating the effectiveness of the materials for the prevention of erosion on typical steep, roadside slopes before the establishment of permanent vegetation. Researchers repeated the vegetation establishment and soil retention portions of the evaluations on two soil types with the option for two different slopes according to the manufacturers preference.

**Texas Reference Marker Automated RI-1 Diagrams**, TX-95/1909-1F, S. Majdi, A. Kalamdani, and H. Charara.

The Automated Road Inventory (ARI) is a software application used to automate the generation of Roadway Inventory (RI-1) diagrams. The RI-1 diagrams, which are hand-drawn visual roadway records created by the Division of Transportation Planning of the Texas Department of Transportation (TxDOT), depict all highways maintained by the department. This report discusses the ARI software that allows these graphical depictions to be entered into a computer system and stored there.



## Other Reports and Publications

### *Nondestructive/ Destructive Tests and Associated Studies on Two Decommissioned Steel*

**Truss Bridges**, FHWA/OH-95/013, A.E. Aktan, R. Naghavi, D.N. Farhey, K.L. Lee, T. Aksel, and K. Hebbar.

Two decommissioned 80-year-old steel truss bridges were subjected to a series of nondestructive and destructive tests. The trusses had built-up members rigidly connected by rivets at the gusset plates. The floor system, many truss members and the connections exhibited considerable deterioration. The bridges were retrofitted at critical connections by welding A36 plates on the pre-A7 steel. Both bridges exhibited acceptable performance during the tests at all the limit states.

**Simulation of Hourly Temperature Gradients in Asphalt Concrete Pavement Structures**, FHWA/OH-95/014, R. Kenneth Wolfe and Roger J. McNichols.

The design of overlays on existing pavements requires an understanding of the strains at the overlay-base interface. The overlay, asphaltic concrete, is a highly temperature sensitive material, resulting in strains which are dependent upon the temperature profiles which exist in the asphalt layer as a result of varying weather conditions during the year.

This study develops procedures which utilize yearly weather data obtained from the National Climatic Data Center

to estimate the temperature profiles that affect the modulus of elasticity/temperature relationship.

**Nondestructive Testing and Identification for Bridge Rating - Phase II**, FHWA/OH-95/021, A.E. Aktan, C. Chuntavan, K.L. Lee, and D.N. Farhey.

Nondestructive dynamic field testing and structural identification studies were done on three (2, 20 and 43-year-old) steel stringer bridges. The rating process used in this study and the resulting factors help to identify and conceptualize a number of unresolved important issues that influence bridge rating and management.

**Discharge Characteristics of Selected Longitudinal Drain Materials**, FHWA/OH-95/020, David E. Straub.

Excessive water in the subbase of a highway, combined with large traffic volumes and heavy loads is a major cause of road deterioration. Prompt removal of any excess water in a subbase will decrease the road deterioration and extend the effective life of the highway. This study presents discharge characteristics of four highway subbase drainage systems.

**Iron Amine Complex Soil Stabilization**, 93-10-Final, Ted S. Vinson and David Hemstreet.

A laboratory test was conducted to verify the suitability of an iron(II) amine complex compound (ACC) to serve as a stabilizer for fine grained soils against frost

heave and thaw weakening. It was observed that the addition of small quantities of ACC greatly reduced the segregation potential of the test soil.

***Effects of Traffic and Wind Loads on a Tied Arch Bridge***, 7-1982-2, Partha P. Sarkar, W. Pennington Vann, et. al.

The purpose of this study is to assess the sensitivity of four highway bridges to wind and live loadings. Each bridge will be of the tied-arch type and will be constructed on-grade over cut areas with clear spans in excess of 61 meters. In this study, the bridge design is analyzed under the expected wind loadings based on assumed aerodynamic parameters and the bridge details furnished by the Texas Department of Transportation.

***Wind Load Effects on Signs, Luminaires, and Traffic Signal Structures***, 1303-F, J.R. McDonald, K.C. Mehta, W. Oler and N. Pulipaka.



The objectives of this study were to revise the wind load section of the Texas DOT standard for highway signs, luminaires and traffic signal structures and to develop strategies to mitigate large vibrations in single mast traffic signal structures subject to cross-wind vibrations.

***Interactive Graphics Intersection Design User's Manual***, FHWA/TX-95-1308-1F, T.W. Rioux, R.F. Inman, R.B. Machemehl, and C.E. Lee.

The Interactive Graphics Intersection Design System (IGIDS) has been developed at the Center for Transportation Research at the University of Texas at Austin, in cooperation with the Texas Department of Transportation and the Federal Highway Administration. IGIDS is a package of drawing, analysis and data manipulation tools for use by the designer of street intersections. This report serves as a IGIDS reference manual.

***Transportation Services, Utilization and Needs of the Elderly in Non-Urban Areas***, DOT-T-95-08, T.R. Leinbach, J.F. Watkins and N. Stamatiadis.

This report explores the mobility problems among the elderly in non-urban areas and offers possible solutions to these problems.

***A Case Study of Overlay Performance of Continuously Reinforced Concrete Pavement (CRCP) Located on IH-35, Bowie County, Texas***, FHWA/TX-95-1342-1, B.F. McCullough, T. Dossey, J. Weissmann, and Yoon-Ho Cho.

This report documents a case study of an overlaid PCC pavement on IH-35 in Bowie County, Texas. The 16 km project was first rehabilitated with an ACP overlay in May of 1986. In June 1993, the project was again scheduled to be rotomilled and overlaid with 5 cm of ACP overlay. This provided a unique opportunity to study the overlay performance. Several different analyses were done during the different stages of the rotomilling and overlay process.

***Investigation of Bonding Materials for Piezoelectric Traffic Monitoring Equipment***, TX-95-2039-1, E.J. Ueber, D.W. Fowler, and R.L. Carrasquillo.

This study was undertaken in an effort to find bonding agents applicable to the installation of piezoelectric traffic monitoring equipment. Laboratory and field tests were performed on several different materials. Analysis and result of these tests is contained in this report.

***An Automated System for Accumulating Count Recorder (ACR) Field Data Collection***, TX-95-2040-1F, ShiFeng Li, Z. Zhang, and T. Dossey.

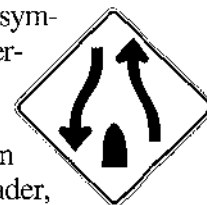
This report described the development of an automated system for collecting state traffic count data, specifically accumulative count recorder (ACR) field data. Included in this report is a user's guide to the new system that was developed.

***An Evaluation of Highway Mowing Procedures for the Reduction of Mower Thrown Object Accidents***, FHWA/TX-95-1441-1F, Michael R. Istre and Kurt M. Marshak.

Control of roadside vegetation is achieved primarily through mowing and the use of herbicides. An unfortunate side effect of mowing operations is the occurrence of mower thrown object accidents. Modifications on the current mowing procedures and other safety recommendations are contained in this report.

***Symbol Signing for Older Drivers***, FHWA-RD-94-069, Swanson Transportation Consultants, Inc.

This study tested the effectiveness of symbol signs for older drivers and offers alternative sign designs for those that were found ineffective. For more information on this report contact Dr. Truman M. Mast, Human Factors Team Leader, HSR-30 at (703) 285-2404.



***Transportation Research Circular***, #447 July 1995.

This edition contains presentations from the 10th equipment management workshop that was held in Portland, Oregon July 31 through August 3, 1994.

***Use of Recycled Materials in Highway Construction: Crushed Recycled Container Glass, Asphalt Shingle Manufacturing Waste and Ground Tire Rubber in Asphalt Concrete***, April 1995, R.F. Baker, E. Connolly and Henry Justus.

This report documents the testing of three different materials, crushed recycled container glass, shingle manufacturing waste and ground tire rubber, as to their effectiveness as additives to asphalt concrete pavement.

**Note:** FHWA Errata No. 1 (November 1994) for Part IV of the Manual on Uniform Traffic Control Devices (MUTCD) is now available in the T2 library.

*The publications listed are available for loan from the Alaska T<sup>2</sup> Program library.  
To borrow any of the materials listed, contact Susan Earp at (907) 451-5320.*

## 1995/96 T2 CALENDAR OF EVENTS

DATE	EVENT	SPONSOR/CONTACT	LOCATION
Nov. 27-28 Nov. 30-Dec. 1	"Change Order Workshop" - Fbks Anchorage	Wells & Bridges (513) 237-0112 or 800-232-9923	TBA
Nov 29 - Dec 1	Intertribal Transportation Association Annual Meeting	ITA, Elsie RedBird, (505) 248-1465	Imperial Palace Las Vegas, Nevada
Dec 11-13	Introduction to Highway Capacity Manual	Alaska T2 Center, (907) 451-5320	Sheraton Anchorage Hotel Anchorage, Alaska
Dec 14-15	Advanced Highway Capacity Manual	Alaska T2 Center, (907) 451-5320	Sheraton Anchorage Hotel Anchorage, Alaska
Jan 7-11, 1996	TRB 75th Annual Meeting	TRB (202) 334-2933	Washington, D.C.
Jan 22-26, 1996	"Drilling and Blasting Techniques"	University of Washington, (206) 543-5539	University of Washington Seattle, Washington
Apr 15-19, 1996	Alaska Transportation Week	DOT&PF/AGC/T2/UAF- TRC/FHWA, (907) 451-5323	Sheraton Anchorage Hotel Anchorage, Alaska

### *Meetings Around Alaska*

Society	Chapter	Meetings Days	Location
ASCE	Anchorage Fairbanks Juneau	Monthly, 3rd Tues., noon Monthly, 3rd Wed., noon Monthly, 1st Wed., noon*	Northern Lights Inn Captain Bartlett Inn Breakwater Inn * except June-August
ASPE	Anchorage Fairbanks	Monthly, 2nd Thurs., noon Monthly, 1st Fri., noon	West Coast International Inn Captain Bartlett Inn
ASPLS	Anchorage Fairbanks Mat-Su Valley	Monthly, 3rd, Tues., noon Monthly, 4th Tues., noon Monthly, last Wed., noon	Executive Cafeteria Federal Building Ethel's Sunset Inn Windbreak Cafe; George Strother, 745-9810
ITE	Anchorage	Monthly, 4th Thurs., noon	Sourdough Mining Company
IRWA	Sourdough Ch. 49 Arctic Trails Ch. 71 Totem Ch. 71	Monthly, 3rd Thurs., noon** Monthly, 2nd Thurs., noon# Monthly, 1st Wed., noon	West Coast Internat'l Inn **except July & Dec. Last Frontier Club #except December Mike's Place, Douglas
ICBO	Northern Chapter	Monthly, 1st Wed., noon	Zach's, Sophie Station
AWRA	Northern Region	Monthly, 3rd Wed., noon Brown Bag Lunch	Room 531 Duckering Bldg., University of Alaska Fairbanks, Larry Hinzman, 474-7331

**To publicize an event in our calendar, contact us at (907) 451-5320.**

## Reckard finds a transportation career and some 'nice folks' on his permanent vacation in Alaska

Matthew Reckard's Alaskan adventure as a young man turned out to be a permanent vacation.

In 1979, Reckard came to Alaska for a long vacation and to visit a friend from school. He never left.

"I met a lot of nice folks in Alaska," says Reckard. "I was offered a job with the DOT & PF; the oil money had started rolling in to the state coffers and the DOT & PF

was on a big building program and they needed all of the engineering help that they could get.

Reckard was born in Providence, Rhode Island but spent most of his early years in Claremont, California. He also spent a year in Oxford, England.

After graduating from Claremont High School, Reckard attended Swarthmore College in Swarthmore, Pennsylvania and received a B.A. in English Literature and a B.S. in Civil Engineering. He later attended the University of Oregon in Eugene and received his M.S. in Historic Preservation.

Before he started at his present position, Reckard gave many years of service to the DOT & PF. Between 1979 and 1991 he held various positions within the DOT & PF, which gave him a diverse background in the transportation field. After three years working as a private engineering and historic pres-

ervation consultant, Reckard returned to the DOT & PF.

Currently, Reckard is developing and managing the Alaska Department of Transportation's research program, the goal of which

is to improve planning, design, construction, operations, and maintenance methods and techniques employed by DOT & PF. Funding for this program presently comes exclusively from the 1/2% of Federal High-

way Administration funding required to go for research under the Intermodal Surface Transportation Efficiency Act of 1991, plus the required state match. In past years, the research program received money from other sources. Reckard hopes it might again some day.

DOT&PF's research program contributes to national programs, especially the National Coordinated Highway Research Program (NCHRP), a joint program of the American Association of State Highway and Traffic Operators (AASHTO), FHWA, and the Transportation Research Board (TRB), a unit of the National Research Council. The research program also donates funding to the Alaska T2 Program.

The research program also sponsors specific research projects related to surface trans-

portation, most of which are done either in-house by DOT&PF staff, the University of Alaska, or jointly.

Although he enjoys his work, Reckard is presently challenged by administration and budgeting matters due to lack of staff.

"I get to do little that could be called science, engineering, or research," Reckard says.

Reckard currently resides in Juneau, but says he misses the Interior, especially Ester, which is almost like an extended family to him.

While not working, Reckard enjoys a multitude of other activities. He played Mr. Mushnik in the Perseverance Theatre production of "Little Shop of Horrors," and now is preparing for rehearsals for a new show, Noel Coward's "Blythe Spirit."

Over the past several years, Reckard has done a lot of volunteer work involving historic research, design and construction.

If he is not working on some historic monument or on the stage, Reckard can be found spending his free time outdoors around the Juneau area kayaking, hiking and camping, or playing on a local soccer team.

In the future, Reckard would like to develop Tolovana Hot Springs, a small remote resort of which he is part owner. He also

hopes to do more historic preservation work, but he says, opportunities for such projects are fairly limited in the state of Alaska.

